

TOIMIVUSDEKLARATSIOON

DoP nr.: MKT-212 - ee

- ✧ Tootetüübi kordumatu identifitseerimiskood: Kiil ankur B
- ✧ Kavandatud kasutusotstarbe: Mehaaniline tüübel ankrusse sisse betoon, vt lisa B
- ✧ Tootja: MKT Metall-Kunststoff-Technik GmbH & Co.KG
Auf dem Immel 2
67685 Weilerbach
- ✧ Jõudluse hindamise ja kontrollimise süsteem: 1
- ✧ Euroopa hindamisdokument:
Euroopa tehniline hinnang:
Tehnilise hindamise asutus:
Teavitatud asutustele:
- EAD 330232-00-0601
ETA-01/0013, 29.11.2018
DIBt, Berlin
NB 1343 – MPA, Darmstadt

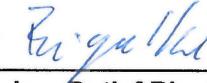
✧ Deklareeritud toimivuse:

Põhiomadused	Toimivus
Mehhaaniline vastupidavus ja stabiilsus (BWR1)	
Iseloomulik vastupidavus tõmbepinge all (staatilised ja kvaasistaatilised efektid)	Lisa / Annex C1 – C2
Iseloomulik vastupidavus külgpinge all (staatilised ja kvaasistaatilised efektid)	Lisa / Annex C3
Nihked (staatilised ja kvaasistaatilised efektid)	Lisa / Annex C4
Seismiliste jõudluskategooriate C1 + C2 iseloomulik vastupidavus ja nihked	Toimivust ei ole kindlaks määratud (NPD)
Tuleohutus (BWR2)	
Tuletundlikkus	Klass A1
Tulekindlus	Toimivust ei ole kindlaks määratud (NPD)

Ülaltoodud toote jõudlus on deklareeritud jõudlus / jõudlus. Eespool nimetatud tootja vastutab toimivusdeklaratsiooni koostamise eest vastavalt määrusele (EU) nr 305/2011.

Tootja poolt ja nimel allkirjastanud:


Stefan Weustenhagen
(Tegevdirektor)
Weilerbach, 29.11.2018

p.p. 
Dipl.-Ing. Detlef Bigalke
(Tootearenduse juht)



Selle toimivusdeklaratsiooni originaal kirjutati saksa keeles. Tõlke kõrvalekallete korral kasutatakse saksakeelset versiooni.

Specifications of intended use

Wedge Anchor B		M6	M8	M10	M12	M16	M20
Materials	electroplated	✓	✓	✓	✓	✓	✓
	Steel zinc plated	-	✓	✓	✓	✓	✓
	hot-dip galvanized						
	sherardized	✓	✓	✓	✓	✓	✓
Stainless steel		A4	✓	✓	✓	✓	✓
High corrosion resistant steel		HCR	✓	✓	✓	✓	✓
Static or quasi-static action					✓		
Reduced anchorage depth					✓		
Uncracked concrete					✓		

Base materials:

- Compacted, reinforced or unreinforced normal weight concrete (without fibers) acc. to EN 206:2013
- Strength classes C20/25 to C50/60 according to EN 206:2013

Use conditions (Environmental conditions):

Structures subject to dry internal conditions	zinc plated steel, stainless steel A4, high corrosion resistant steel HCR
Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition, if no particular aggressive conditions exist	stainless steel A4, high corrosion resistant steel HCR
Structures subject to external atmospheric exposure and to permanently damp internal condition, if other particular aggressive conditions exist ¹⁾	high corrosion resistant steel HCR

¹⁾ Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages are designed according to EN 1992-4:2018 or TR 055

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load it is not in the direction of load application.
- Anchor installation such that the effective anchorage depth is complied with. This compliance is ensured, if the thickness of fixture is not greater than the maximum thickness of fixture marked on the anchor in accordance with Annex A1 and A2 and the hexagon nut is placed at the end of the conical bolt as delivered by the manufacturer.

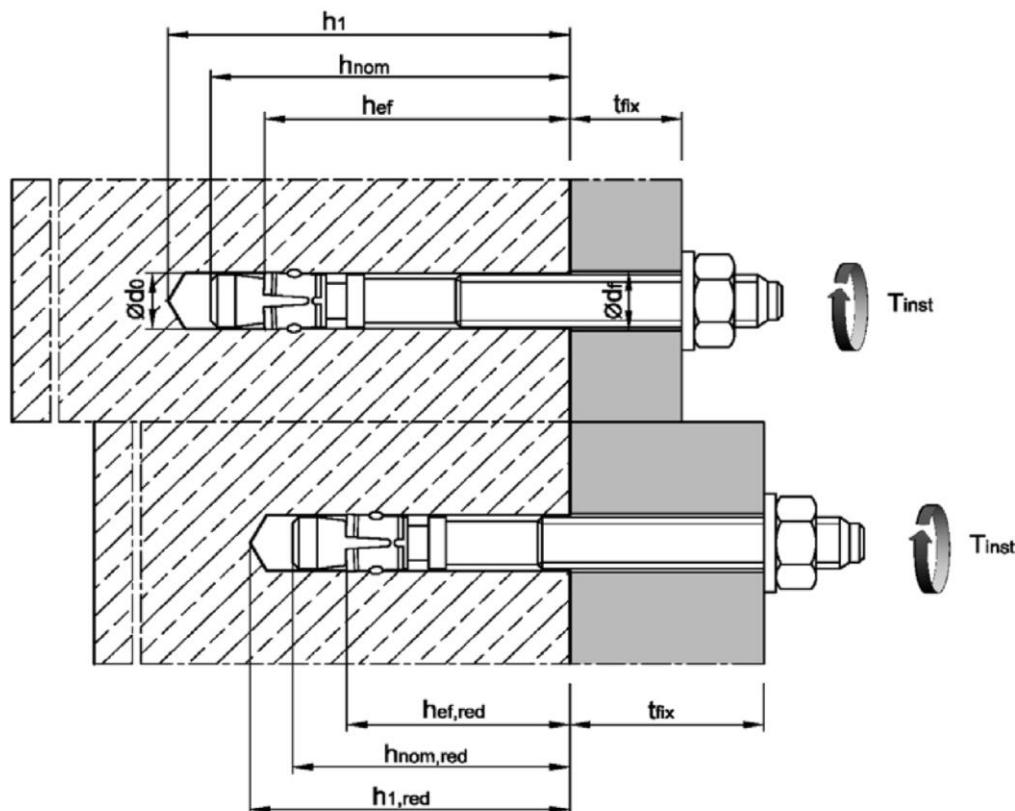
Wedge Anchor B

Intended use
Specifications

Annex B1

Table B1: Installation parameters, steel zinc plated

Anchor size	M6	M8	M10	M12	M16	M20
Nominal drill hole diameter $d_0 \leq [\text{mm}]$	6	8	10	12	16	20
Cutting diameter of drill bit $d_{\text{cut}} \leq [\text{mm}]$	6,40	8,45	10,45	12,5	16,5	20,55
Installation torque (electroplated) $T_{\text{inst}} = [\text{Nm}]$	8	15	30	50	100	200
Installation torque (hot-dip galvanized) $T_{\text{inst}} = [\text{Nm}]$	-	15	30	40	90	120
Installation torque (sherardized) $T_{\text{inst}} = [\text{Nm}]$	5	15	30	40	90	120
Diameter of clearance hole in the fixture $d_f \leq [\text{mm}]$	7	9	12	14	18	22
Standard anchorage depth						
Depth of drill hole $h_1 \geq [\text{mm}]$	55	65	70	90	110	130
Embedment depth $h_{\text{nom}} \geq [\text{mm}]$	49	56	62	82	102	121
Effective anchorage depth $h_{\text{ef}} \geq [\text{mm}]$	40	44	48	65	82	100
Reduced anchorage depth						
Depth of drill hole $h_{1,\text{red}} \geq [\text{mm}]$	45	55	65	75	95	110
Embedment depth $h_{\text{nom},\text{red}} \geq [\text{mm}]$	39	47	56	67	84	99
Effective anchorage depth $h_{\text{ef},\text{red}} \geq [\text{mm}]$	30	35	42	50	64	78



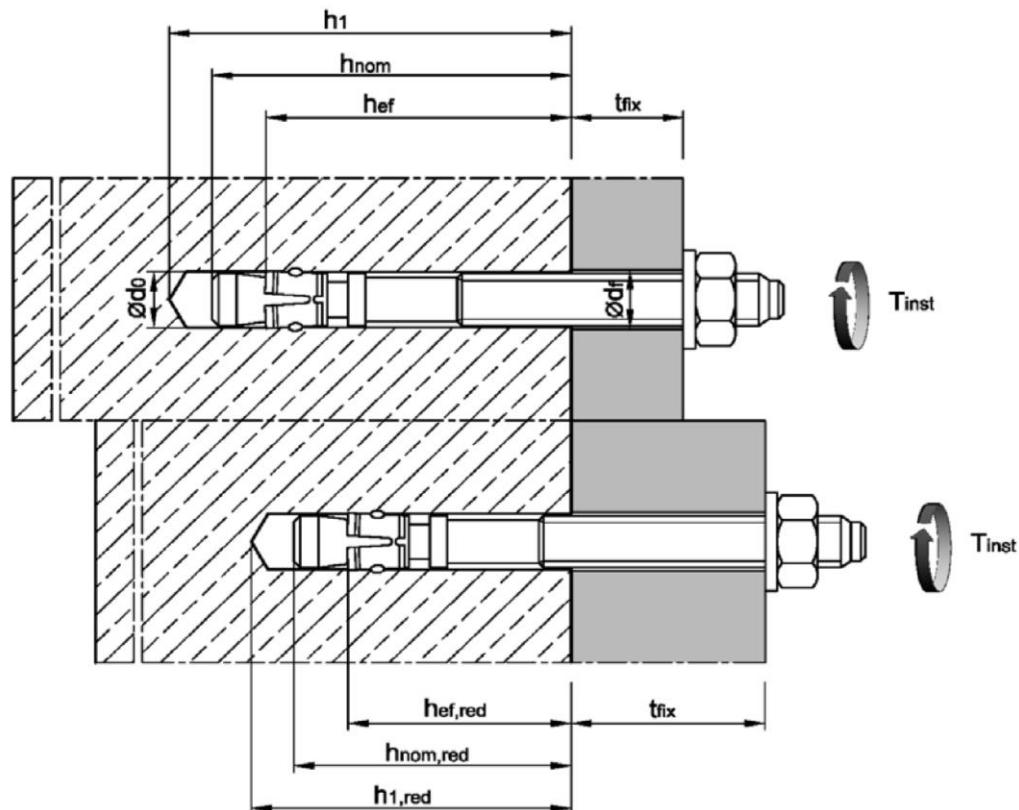
Wedge Anchor B

Intended use
Installation data, steel zinc plated

Annex B2

Table B2: Installation parameters, stainless steel A4 / HCR

Anchor size		M6	M8	M10	M12	M16	M20
Nominal drill hole diameter	$d_0 =$ [mm]	6	8	10	12	16	20
Cutting diameter of drill bit	$d_{cut} \leq$ [mm]	6,40	8,45	10,45	12,5	16,5	20,55
Installation torque	$T_{inst} =$ [Nm]	6	15	25	50	100	160
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	7	9	12	14	18	22
Standard anchorage depth							
Depth of drill hole	$h_1 \geq$ [mm]	55	65	70	90	110	130
Embedment depth	$h_{nom} \geq$ [mm]	49	56	62	81	99	121
Effective anchorage depth	$h_{ef} \geq$ [mm]	40	44	48	65	80	100
Reduced anchorage depth							
Depth of drill hole	$h_{1,red} \geq$ [mm]	45	55	65	75	95	110
Embedment depth	$h_{nom,red} \geq$ [mm]	39	47	56	66	83	99
Effective anchorage depth	$h_{ef,red} \geq$ [mm]	30	35	42	50	64	78



Wedge Anchor B

Intended use
Installation data, stainless steel A4/HCR

Annex B3

Table B3: Minimum spacings and edge distances, steel zinc plated

Anchor size	M6	M8	M10	M12	M16	M20	
Standard anchorage depth h_{ef}							
Minimum member thickness	h_{min} [mm]	100	100	100	130	170	200
Minimum spacing	s_{min} [mm]	35	40	55	75	90	105
Minimum edge distance	c_{min} [mm]	40	45	65	90	105	125
Reduced anchorage depth $h_{ef,red}$							
Minimum member thickness	h_{min} [mm]	80	80	100	100	130	160
Minimum spacing	s_{min} [mm]	35	40	55	100	100	140
Minimum edge distance	c_{min} [mm]	40	45	65	100	100	140

Table B4: Minimum spacings and edge distances, stainless steel A4 / HCR

Anchor size	M6	M8	M10	M12	M16	M20	
Standard anchorage depth h_{ef}							
Minimum member thickness	h_{min} [mm]	100	100	100	130	160	200
Minimum spacing	s_{min} [mm]	35	35	45	60	80	100
	for $c \geq$ [mm]	40	65	70	100	120	150
Minimum edge distance	c_{min} [mm]	35	45	55	70	80	100
	for $s \geq$ [mm]	60	110	80	100	140	180
Reduced anchorage depth $h_{ef,red}$							
Minimum member thickness	h_{min} [mm]	80	80	100	100	130	160
Minimum spacing	s_{min} [mm]	35	60	55	100	110	140
Minimum edge distance	c_{min} [mm]	40	60	65	100	110	140

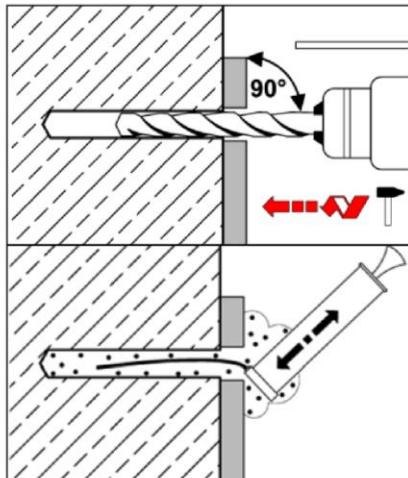
Intermediate values by linear interpolation.

Wedge Anchor B**Intended use**

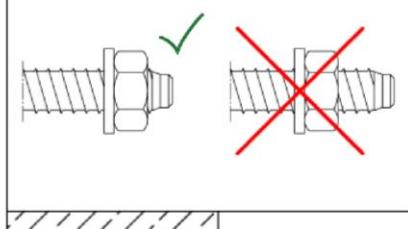
Minimum spacings and edge distances

Annex B4

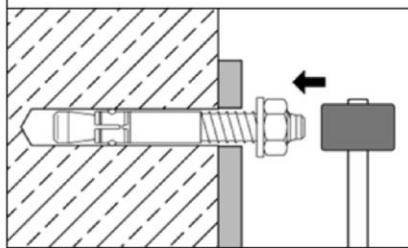
Installation instructions



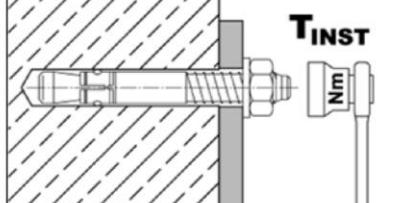
Drill hole perpendicular to concrete surface, positioning of the drill holes without damaging the reinforcement.



Check position of nut.



Drive in anchor, such that h_{ref} or $h_{\text{ref,red}}$ is met. This is ensured, if the thickness of fixture is not greater than the maximum thickness of fixture marked on the anchor in accordance with Annex A2 and A3.



Apply installation torque T_{inst} as specified in Table B2.

Wedge Anchor B

Intended use
Installation instructions

Annex B5

Table C1: Characteristic values for tension loads, steel zinc plated

Anchor size		M6	M8	M10	M12	M16	M20					
Installation factor	γ_{inst}	[-]		1,0								
Steel failure												
Characteristic resistance	$N_{Rk,s}$	[kN]	8,7	15,3	26	35	65					
Partial factor	γ_{Ms}	[-]	1,5			1,6						
Pull-out												
Standard anchorage depth h_{ef}												
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	9	12	16	1)	1)					
Reduced anchorage depth $h_{\text{ef,red}}$												
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	6 ²⁾	1) 2)	1)	1)	1)					
Increasing factor for $N_{Rk,p}$	ψ_c	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$									
Splitting												
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	min [$N_{Rk,p}$; $N^0_{Rk,c}$]									
Standard anchorage depth h_{ef}												
Spacing	$s_{\text{cr,sp}}$	[mm]	160	220	240	330	410					
Edge distance	$c_{\text{cr,sp}}$	[mm]	80	110	120	165	205					
Reduced anchorage depth $h_{\text{ef,red}}$												
Spacing	$s_{\text{cr,sp}}$	[mm]	180	210	230	240	320					
Edge distance	$c_{\text{cr,sp}}$	[mm]	90	105	115	120	160					
Concrete cone failure												
Standard anchorage depth h_{ef}												
Effective anchorage depth	$h_{\text{ef}} \geq$	[mm]	40	44	48	65	82					
Spacing	$s_{\text{cr,N}}$	[mm]	3 h_{ef}									
Edge distance	$c_{\text{cr,N}}$	[mm]	1,5 h_{ef}									
Reduced anchorage depth $h_{\text{ef,red}}$												
Effective anchorage depth	$h_{\text{ef,red}} \geq$	[mm]	30 ²⁾	35 ²⁾	42	50	64					
Spacing	$s_{\text{cr,N}}$	[mm]	3 $h_{\text{ef,red}}$									
Edge distance	$c_{\text{cr,N}}$	[mm]	1,5 $h_{\text{ef,red}}$									
Factor for k_1	$k_{\text{ucr,N}}$	[-]	11,0									

¹⁾ Pullout failure is not decisive

²⁾ Use restricted to anchorages of indeterminate structural components

Wedge Anchor B

Performance

Characteristic values for tension loads, steel zinc plated

Annex C1

Table C2: Characteristic values for tension loads, stainless steel A4 / HCR

Anchor size		M6	M8	M10	M12	M16	M20					
Installation factor	γ_{inst}	[-]		1,0								
Steel failure												
Characteristic resistance	$N_{Rk,s}$	[kN]	10	18	30	44	88					
Partial factor	γ_{Ms}	[-]	1,50			1,68						
Pull-out												
Standard anchorage depth h_{ef}												
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	7,5	12	16	25	1)					
Reduced anchorage depth $h_{\text{ef,red}}$												
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	6 ²⁾	9 ²⁾	12	1)	1)					
Splitting												
Standard anchorage depth h_{ef}												
The higher one of the decisive resistances of Case 1 and Case 2 is applicable.												
Case 1												
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	6	9	12	20	30					
Spacing	$s_{\text{cr,sp}}$	[mm]	3 h_{ef}									
Edge distance	$c_{\text{cr,sp}}$	[mm]	1,5 h_{ef}									
Case 2												
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	7,5	12	16	25	1)					
Spacing	$s_{\text{cr,sp}}$	[mm]	160	220	240	340	410					
Edge distance	$c_{\text{cr,sp}}$	[mm]	80	110	120	170	205					
Reduced anchorage depth $h_{\text{ef,red}}$												
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	6 ²⁾	9 ²⁾	12	1)	1)					
Spacing	$s_{\text{cr,sp}}$	[mm]	180	210	230	300	320					
Edge distance	$c_{\text{cr,sp}}$	[mm]	90	105	115	150	160					
Increasing factor for $N_{Rk,p}$ and $N^0_{Rk,sp}$	ψ_c	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$									
Concrete cone failure												
Standard anchorage depth h_{ef}												
Effective anchorage depth	h_{ef}	[mm]	40	44	48	65	80					
Spacing	$s_{\text{cr,N}}$	[mm]	3 h_{ef}									
Edge distance	$c_{\text{cr,N}}$	[mm]	1,5 h_{ef}									
Reduced anchorage depth $h_{\text{ef,red}}$												
Effective anchorage depth	$h_{\text{ef,red}}$	[mm]	30 ²⁾	35 ²⁾	42	50	64					
Spacing	$s_{\text{cr,N}}$	[mm]	3 h_{ef}									
Edge distance	$c_{\text{cr,N}}$	[mm]	1,5 h_{ef}									
Factor for k_1	$k_{\text{ucr,N}}$	[-]	11,0									

¹⁾ Pullout failure is not decisive.

²⁾ Use restricted to anchorages of indeterminate structural components.

Wedge Anchor B

Performance

Characteristic values for tension loads, stainless steel A4 / HCR

Annex C2

Table C3: Characteristic values for shear loads, steel zinc plated

Anchor size		M6	M8	M10	M12	M16	M20
Installation factor	γ_{inst}	[$-$]				1,0	
Steel failure without lever arm							
Characteristic resistance	$V^0_{Rk,s}$	[kN]	5	11	17	25	44
Ductility factor	k_7	[$-$]				1,0	
Steel failure with lever arm							
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	9	23	45	78	186
Partial factor for $V^0_{Rk,s}$ and $M^0_{Rk,s}$	γ_{Ms}	[$-$]			1,25		1,33
Concrete pry-out failure							
Factor for h_{ef}	k_8	[$-$]	1,0	1,0	1,0	2,0	2,0
Factor for $h_{ef,red}$	k_8	[$-$]	1,0 ¹⁾	1,0 ¹⁾	1,0	1,0	2,0
Concrete edge failure							
Effective length of anchor in shear loading for h_{ef}	l_f	[mm]	40	44	48	65	82
Effective length of anchor in shear loading for $h_{ef,red}$	l_f	[mm]	30 ¹⁾	35 ¹⁾	42	50	64
Outside diameter of anchor	d_{nom}	[mm]	6	8	10	12	16
20							

¹⁾ Use restricted to anchorages of indeterminate structural components

Table C4: Characteristic values for shear loads, stainless steel A4/HCR

Anchor Size		M6	M8	M10	M12	M16	M20
Installation factor	γ_{inst}	[$-$]				1,0	
Steel failure without lever arm							
Characteristic resistance	$V^0_{Rk,s}$	[kN]	7	12	19	27	50
Ductility factor	k_7	[$-$]				1,0	
Steel failure with lever arm							
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	10	24	49	85	199
Partial factor for $V^0_{Rk,s}$ and $M^0_{Rk,s}$	γ_{Ms}	[$-$]			1,25		1,4
Concrete pry-out failure							
Factor for h_{ef}	k_8	[$-$]	1,0	1,0	1,0	2,0	2,0
Factor for $h_{ef,red}$	k_8	[$-$]	1,0 ¹⁾	1,0 ¹⁾	1,0	1,0	2,0
Concrete edge failure							
Effective length of anchor in shear loading with h_{ef}	l_f	[mm]	40	44	48	65	80
Effective length of anchor in shear loading with $h_{ef,red}$	l_f	[mm]	30 ¹⁾	35 ¹⁾	42	50	64
Outside diameter of anchor	d_{nom}	[mm]	6	8	10	12	16
20							

¹⁾ Use restricted to anchorages of indeterminate structural components

Wedge Anchor B

Performance
Characteristic values for shear loads

Annex C3

Table C5: Displacements under **tension loads, steel zinc plated**

Anchor size	M6	M8	M10	M12	M16	M20		
Standard anchorage depth								
Tension load	N	[kN]	4,3	5,8	7,6	11,9	16,7	23,8
Displacement	δ_{N0}	[mm]	0,4		0,5			
	$\delta_{N\infty}$	[mm]	0,7		2,3			
Reduced anchorage depth								
Tension load	N	[kN]	2,9	5,0	6,5	8,5	12,3	16,6
Displacement	δ_{N0}	[mm]	0,3		0,4			
	$\delta_{N\infty}$	[mm]	0,6		1,8			

Table C6: Displacements under **tension loads, stainless steel A4/HCR**

Anchor size	M6	M8	M10	M12	M16	M20		
Standard anchorage depth								
Tension load	N	[kN]	3,6	5,7	7,6	11,9	17,2	24,0
Displacement	δ_{N0}	[mm]	0,7	0,9	0,5	0,6	0,9	2,1
	$\delta_{N\infty}$	[mm]		1,8			4,2	
Reduced anchorage depth								
Tension load	N	[kN]	2,9	4,3	5,7	8,5	12,3	16,6
Displacement	δ_{N0}	[mm]	0,4	0,7	0,4	0,4	0,6	1,5
	$\delta_{N\infty}$	[mm]		1,3			2,9	

Table C7: Displacements under **shear loads, steel zinc plated**

Anchor size	M6	M8	M10	M12	M16	M20		
Shear load	V	[kN]	2,9	6,3	9,7	14,3	23,6	37,0
Displacement	δ_{V0}	[mm]	1,2	1,5	1,6	2,6	3,1	4,4
	$\delta_{V\infty}$	[mm]	2,4	2,2	2,4	3,9	4,6	6,6

Table C8: Displacements under **shear loads, stainless steel A4/HCR**

Anchor Size	M6	M8	M10	M12	M16	M20		
Shear load	V	[kN]	4,0	6,9	10,9	15,4	28,6	43,7
Displacement	δ_{V0}	[mm]	1,1	2,0	1,2	2,0	2,2	2,1
	$\delta_{V\infty}$	[mm]	1,7	3,0	1,8	3,0	3,3	3,2

Wedge Anchor BPerformance
Displacements**Annex C4**